

*On the Biological and Morphological Value of the Bulbilli of Fungi.* By M. HUGO ZUKAL.

The peculiar reproductive organs called "bulbilli" described by Eidam (Cohn's Beitr. zur Biol. iii.) have been found by the author in five fungi, namely *Helicosporangium coprophilum*, sp. n., *Dendryphium bulbiferum*, sp. n., *Haplotrichum roseum*, Link, *Melanospora finicola*, Haus., and a *Peziza*. He ascertained that, as stated by Eidam, only conidial forms are, as a rule, developed from the bulbilli.

But in two instances, namely in *Melanospora* and *Peziza*, the bulbilli become converted into fruits, and hence he came to the conclusion that the bulbilli are to be regarded *morphologically* as undeveloped fruits, and therefore as aborted structures. In many fruits of Ascomycetes the bulbillus-form may occur as a perfectly normal stage of development. The so-called *sclerotia* of *Penicillium glaucum* may also be only modified bulbilli. The small bulbilli, in which little reserve-material is stored up, generally develop no fruits, but only mycelia.

The author remarks that his investigations on the whole confirm Eidam's statements, especially the fact that vegetative bodies occur in Fungi which behave biologically like the brood-bodies of the higher plants, but at the same time differ considerably in their structure from the sclerotia. But his observations, especially upon the species of *Peziza*, lead him to dissent from Eidam's further assertion—that fruits never proceed from these bulbilli.

As regards the theoretical estimation of the bulbilli, also, his views differ essentially from Eidam's. Eidam regards the bulbilli as perfectly normal structures, "spore-coils," which belong, as a definite reproductive form, to the developmental cycle of the Fungus in which they occur. The author's investigations lead him, on the contrary, to the opinion that the so-called bulbilli are not to be considered normal structures, but more or less undeveloped fruits, which have become heterogeneously developed in consequence of disturbing causes (mites, parasitic fungi, cold, heat, drought). Karsten's statement ('Bot. Untersuch. aus dem phys. Laboratorium in Berlin,' Heft i. 1865, cited by Eidam) to the effect that it occasionally happens that a central cell of the bulbillus of *Helicosporangium parasiticum* becomes converted into an ascus containing eight elliptical spores, is therefore regarded by the author as perfectly correct. Karsten even saw an aborted perithecium which contained eight rudimentary spores. Consequently, the author says, such forms as *Papulaspora aspergilliformis* and *Helicosporangium parasiticum* can only be regarded as independent Fungi until the developed fruit-forms belonging to them shall be discovered, and the same statement applies to the forms here described by him as new.—*Verh. zool.-bot. Gesellsch. in Wien*, Bd. xxxvi. pp. 123-136.